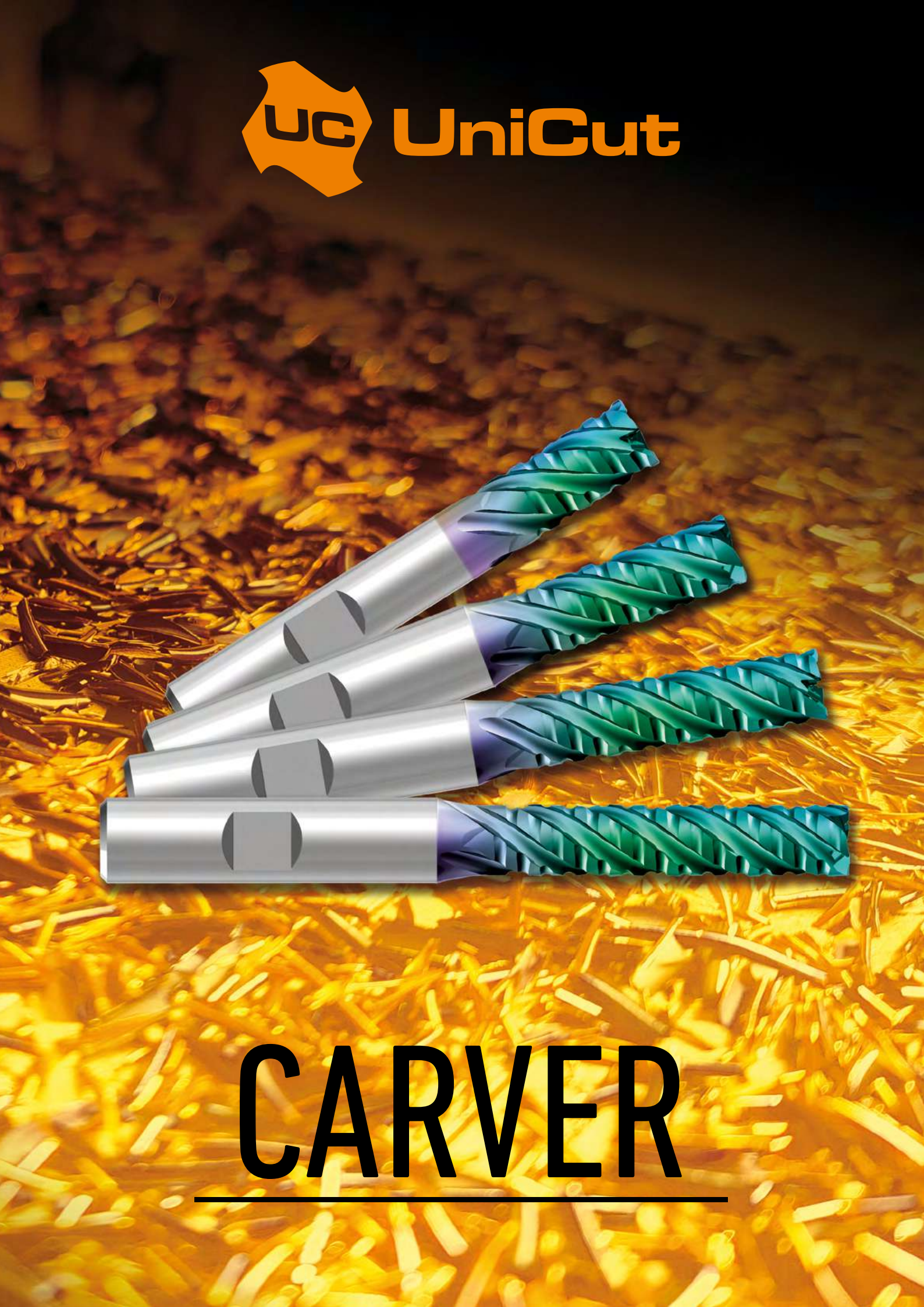
UniCut



CARVER

New UniCut “CARVER” End Mills

F8662 Carver 200
2 x D

F8663 Carver 300
3 x D

F8664 Carver 400
4 x D

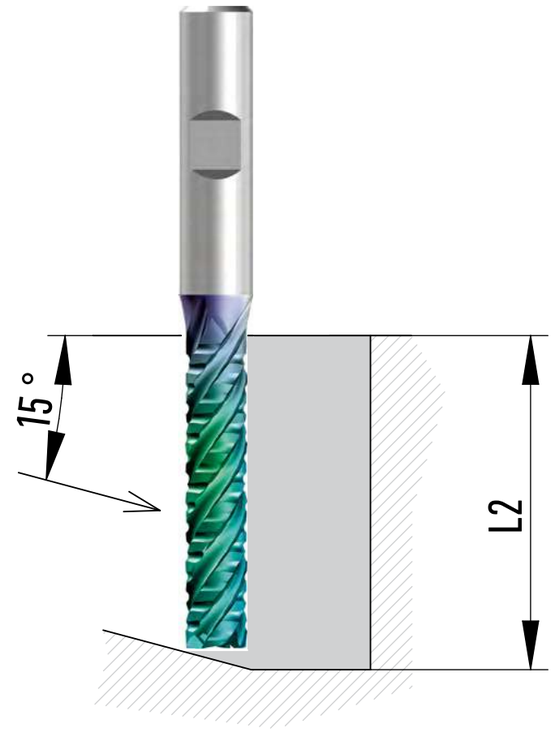
F8665 Carver 500
5 x D

UniCut Carver end mills are designed for full milling:
slotting, carving, up milling with full Ae and are also suitable
for adaptive down milling with partial Ae
| outperforming the existing types PocketMaster, 2D-JET, UniCut “RC”

Capabilities of UniCut CARVER End Mills

Inclined plunge at ramp angle up to 15°, to full depth L2

Required for plunging into a closed slot. The end mill is in engagement with peripheral edge but also frontally.
The plunge to the full length of the L2 cutting edge is verified.

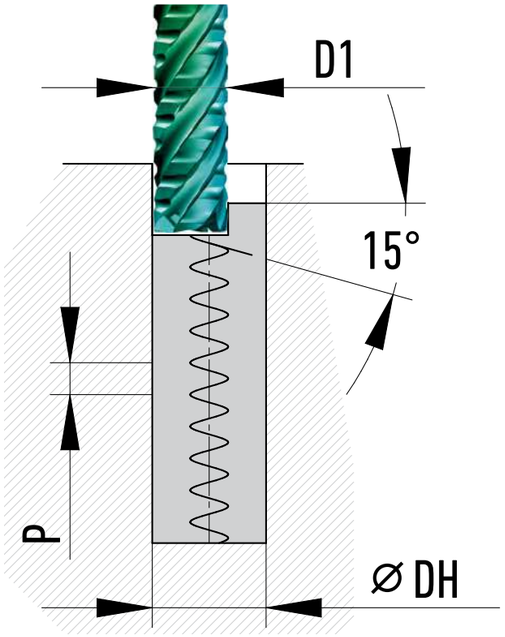


video

Capabilities of UniCut CARVER End Mills

Extremely fast helix plunge at 15° to full L2 depth

Necessary for plunging into a closed pocket. When plunging, a hole with a diameter of 1,6 times the end mill diameter is drilled. The plunge is very fast, e.g. the 10mm end mill needs only 27 seconds to descend to a depth of 50 mm.



Helix pitch for a 15° descending angle,
for a given end mill and hole diameter

D1... end mill diameter
DH... milled hole diameter
P... helix pitch (corresponds to descending angle of 15°, measured in the end mill axis)

D1	4	5	6	8	10	12	14	16	20
DH	6,4	8	9,6	12,8	16	19,2	22,4	25,6	32
P	2,1	2,6	3,1	4,1	5,1	6,1	7,1	8,1	10,1

video

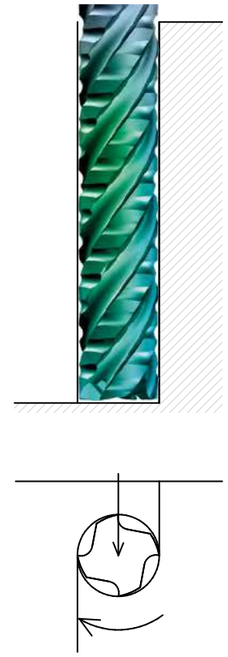
Capabilities of UniCut CARVER End Mills

Full slot milling

Full milling is verified to full L2 cutting edge length,
in steel up to 750 MPa strength.

Intense up milling with full Ap + Ae.

Roughing pocket or roughing fitting strategy,
suitable for heavier machines with lower dynamics

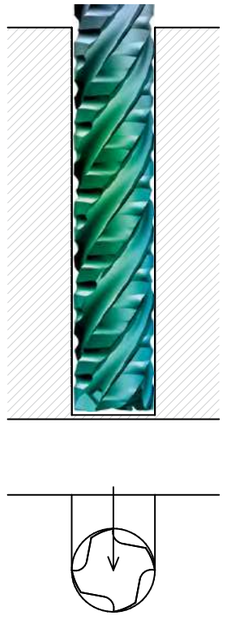


Capabilities of UniCut CARVER End Mills

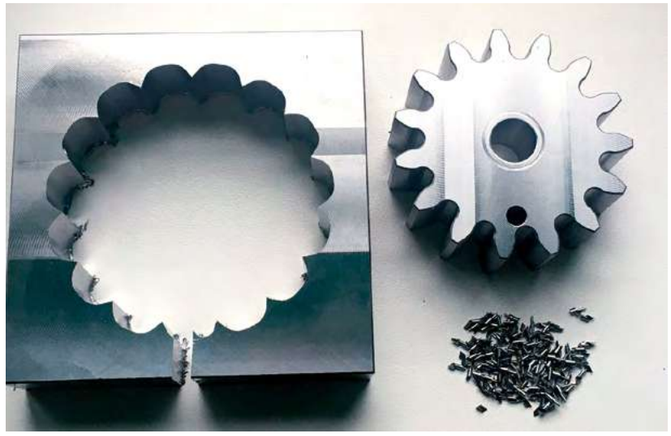
Carving shapes from steel plates

Fig. 1

Fig. 2



It is proven for steels up to 750 MPa. It can be milled through (Fig.1) or with a thin bottom, which is then milled or broken off (Fig.2). When milling through the material, attention needs to be paid to the direction of traversing the shape, depending on which part is fixed and which is not.
The basic requirement is the direction of the feed: **always use up-milling in relation to the part that is not fixed.**
It is advisable to have the carved parts supported so that they **only fall a few millimetres.**
It is possible to carve on the horizontal boring machines, but here **the end mill should always be in the upper part when the separation of the part** to be cut is completed and the part falls down.



- Milling is inaudible and vibration-free when properly tuned
- The savings are greater the larger the carved parts.

video

Capabilities of UniCut CARVER End Mills

Benefits of UniCut CARVER end mills

- Impressive metal removal rate in full or adaptive milling.
- Extended technological possibilities – common roughing + shape cutting + deep milling of slots and cavities.
- Carver actually forms ideal chips when milling to full. They are lightweight spirals that can be blown or flushed out well even from narrow cavities, where they willingly roll away on the table.
- At the same time, these spirals are not easily drawn back into the cut, as happens with leaf-shaped chips. Proof of this is that Carver end mills cutting edges are smooth and chip-free after milling.

- Carver end mills have a split blade, yet the resulting surface is flat and meets the requirement for a roughened and pre-finished surface.
- Carver end mills can be sharpened well in the slot with moderate wear while maintaining the diameter
- Larger and slower CNC machines achieve high metal removal rate at low speeds and feeds with Carver, saving energy and ball screws

Full milling is usually inaudible and vibration-free

Cooling and lubrication

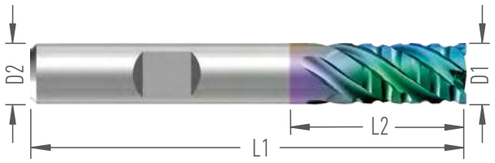
we recommend lubrication/cooling with emulsions, especially in full milling operations (cutting, peeling) where a lot of heat is generated. The emulsion also minimises material sticking to the cutting edge, thereby reducing friction and overall cutting resistance. All this increases the life of the cutting edge.

Warning

When roughing, it is necessary to take into account the cushioning of the end mill and leave sufficient allowance for finishing. For a 5xd d10 end mills, an allowance of 1 mm per wall is recommended.

Carver 200 F8662

4 Flute Square Alternate Edge Rougher



Name	Dimensions (mm)								Order number	Stock	
	D1	D2	D3	L1	L2	L3	R	Z		V	W
F8662.4.V(W)6.57.9.Z4	4	6		57	9			4	13560	□	■
F8662.5.V(W)6.57.12.Z4	5	6		57	12			4	13559	□	■
F8662.6.V(W)6.57.14.Z4	6	6		57	14			4	13558	□	■
F8662.8.V(W)8.63.18.Z4	8	8		63	18			4	13557	□	■
F8662.10.V(W)10.72.24.Z4	10	10		72	24			4	13527	□	■
F8662.12.V(W)12.83.29.Z4	12	12		83	29			4	13561	□	■
F8662.14.V(W)14.83.28.Z4	14	14		83	28			4	13562	□	■
F8662.16.V(W)16.92.33.Z4	16	16		92	33			4	13563	□	■
F8662.20.V(W)20.104.42.Z4	20	20		104	42			4	13564	□	■

FEATURES

- Helix Angle 38°
- Non Center Cutting
- Chamfer 45°
- Center coolant supply
- Chip dividers on outside diameter
- Aurora X Plus TiAlSiXN coating

APPLICATION

- Roughing and Semi-finishing
- Immersion on 15° angle into full Ap/Ae
- Milling at full Ap/Ae smooth and silent
- Small chips easily removable
- Leaves straight sufrace (not smooth)
- Extremely powerfull and safe roughing tool

2 x D do plna
2 x D slotting ability

Cutting Conditions F8662

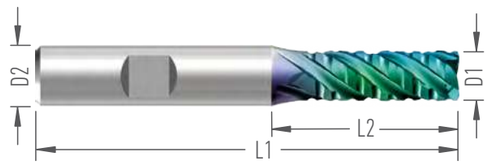
UMC		Ap	Ae	Vc	fz according to the cutter diameter								
					4	5	6	8	10	12	14	16	20
P1-2	E	Dx2	Dx0,25	180	0,046	0,055	0,065	0,085	0,104	0,117	0,130	0,156	0,182
		Dx2	Dx0,75	110	0,023	0,029	0,046	0,059	0,072	0,078	0,085	0,091	0,104
		Dx2	Dx1	110	0,021	0,026	0,039	0,052	0,065	0,072	0,078	0,085	0,091
		∢α	15°	140	0,026	0,033	0,039	0,052	0,059	0,065	0,072	0,078	0,085
P3-4	E	Dx2	Dx0,25	160	0,046	0,055	0,065	0,085	0,104	0,117	0,130	0,156	0,182
		Dx2	Dx0,75	100	0,023	0,029	0,046	0,059	0,072	0,078	0,085	0,091	0,104
		Dx2	Dx1	100	0,021	0,026	0,039	0,052	0,065	0,072	0,078	0,085	0,091
		∢α	15°	120	0,026	0,033	0,039	0,052	0,059	0,065	0,072	0,078	0,085
P5	E	Dx2	Dx0,25	150	0,046	0,055	0,065	0,085	0,104	0,117	0,130	0,156	0,182
		Dx2	Dx0,75	90	0,023	0,029	0,046	0,059	0,072	0,078	0,085	0,091	0,104
		Dx2	Dx1	90	0,021	0,026	0,039	0,052	0,065	0,072	0,078	0,085	0,091
		∢α	15°	100	0,026	0,033	0,039	0,052	0,059	0,065	0,072	0,078	0,085
P6	E	Dx2	Dx0,25	130	0,0455	0,055	0,065	0,085	0,104	0,117	0,130	0,156	0,182
		Dx2	Dx0,75	85	0,0234	0,029	0,046	0,059	0,072	0,078	0,085	0,091	0,104
		Dx2	Dx1	85	0,0208	0,026	0,039	0,052	0,065	0,072	0,078	0,085	0,091
		∢α	15°	90	0,026	0,033	0,039	0,052	0,059	0,065	0,072	0,078	0,085

RECOMMENDED VALUES FOR HELICAL IMMERSION

D1	4	5	6	8	10	12	14	16	20
DH	6,4	8	9,6	12,8	16	19,2	22,4	25,6	32
P	2,1	2,6	3,1	4,1	5,1	6,1	7,1	8,1	10,1

Carver 300 F8663

4 Flute Square Alternate Edge Rougher



Name	Dimensions (mm)								Order number	Stock	
	D1	D2	D3	L1	L2	L3	R	Z		V	W
F8663.4.V(W)6.57.12.Z4	4	6		57	12			4	13551	□	■
F8663.5.V(W)6.57.15.Z4	5	6		57	15			4	13552	□	■
F8663.6.V(W)08.63.18.Z4	6	8		63	18			4	13532	□	■
F8663.8.V(W)10.68.24.Z4	8	10		68	24			4	13533	□	■
F8663.10.V(W)12.83.30.Z4	10	12		83	30			4	13534	□	■
F8663.12.V(W)12.87.36.Z4	12	14		87	36			4	13535	□	■
F8663.14.V(W)16.97.43.Z4	14	16		97	43			4	13536	□	■
F8663.16.V(W)16.108.48.Z4	16	16		108	48			4	13537	□	■
F8663.20.V(W)20.126.60.Z4	20	20		126	60			4	13538	□	■

FEATURES

- Helix Angle 38°
- Non Center Cutting
- Chamfer 45°
- Center coolant supply
- Chip dividers on outside diameter
- Aurora X Plus TiAlSiXN coating

APPLICATION

- Roughing and Semi-finishing
- Immersion on 15° angle into full Ap/Ae
- Milling at full Ap/Ae smooth and silent
- Small chips easily removable
- Leaves straight sufrace (not smooth)
- Extremely powerfull and safe roughing tool

3 x D do plna
3 x D slotting ability

Cutting Conditions F8663

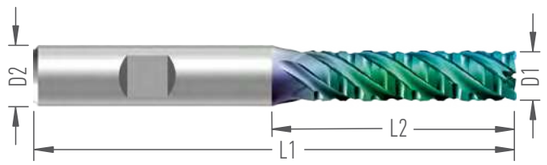
UMC		Ap	Ae	Vc	f_z according to the cutter diameter								
					4	5	6	8	10	12	14	16	20
P1-2	E	D×3	Dx0,25	180	0,035	0,042	0,050	0,065	0,080	0,090	0,100	0,120	0,140
		D×3	Dx0,75	110	0,018	0,022	0,035	0,045	0,055	0,060	0,065	0,070	0,080
		D×3	Dx1	110	0,016	0,020	0,030	0,040	0,050	0,055	0,060	0,065	0,070
		∢α	15°	140	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P3-4	E	D×3	Dx0,25	160	0,035	0,042	0,050	0,065	0,080	0,090	0,100	0,120	0,140
		D×3	Dx0,75	100	0,018	0,022	0,035	0,045	0,055	0,060	0,065	0,070	0,080
		D×3	Dx1	100	0,016	0,020	0,030	0,040	0,050	0,055	0,060	0,065	0,070
		∢α	15°	120	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P5	E	D×3	Dx0,25	150	0,035	0,042	0,050	0,065	0,080	0,090	0,100	0,120	0,140
		D×3	Dx0,75	90	0,018	0,022	0,035	0,045	0,055	0,060	0,065	0,070	0,080
		D×3	Dx1	90	0,016	0,020	0,030	0,040	0,050	0,055	0,060	0,065	0,070
		∢α	15°	100	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P6	E	D×3	Dx0,25	130	0,035	0,042	0,050	0,065	0,080	0,090	0,100	0,120	0,140
		D×3	Dx0,75	85	0,018	0,022	0,035	0,045	0,055	0,060	0,065	0,070	0,080
		D×3	Dx1	85	0,016	0,020	0,030	0,040	0,050	0,055	0,060	0,065	0,070
		∢α	15°	90	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065

RECOMMENDED VALUES FOR HELICAL IMMERSION

D1	4	5	6	8	10	12	14	16	20
DH	6,4	8	9,6	12,8	16	19,2	22,4	25,6	32
P	2,1	2,6	3,1	4,1	5,1	6,1	7,1	8,1	10,1

Carver 400 F8664

4 Flute Square Alternate Edge Rougher



Name	Dimensions (mm)								Order number	Stock	
	D1	D2	D3	L1	L2	L3	R	Z		V	W
F8664.4.V(W)6.57.16.Z4	4	8		57	16			4	13569	□	■
F8664.5.V(W)6.57.20.Z4	5	8		57	20			4	13568	□	■
F8664.6.V(W)8.63.24.Z4	6	8		63	24			4	13567	□	■
F8664.8.V(W)10.80.32.Z4	8	10		80	32			4	13566	□	■
F8664.10.V(W)12.90.40.Z4	10	12		90	40			4	13541	□	■
F8664.12.V(W)14.100.48.Z4	12	14		100	48			4	13565	□	■
F8664.14.V(W)16.110.56.Z4	14	16		110	56			4	13570	□	■
F8664.16.V(W)16.127.64.Z4	16	16		127	64			4	13571	□	■
F8664.20.V(W)20.144.80.Z4	20	20		144	80			4	13572	□	■

FEATURES

- Helix Angle 38°
- Non Center Cutting
- Chamfer 45°
- Center coolant supply
- Chip dividers on outside diameter
- Aurora X Plus TiAlSiXN coating

APPLICATION

- Roughing and Semi-finishing
- Immersion on 15° angle into full Ap/Ae
- Milling at full Ap/Ae smooth and silent
- Small chips easily removable
- Leaves straight sufrace (not smooth)
- Extremely powerfull and safe roughing tool

4 x D do plna
4 x D slotting ability

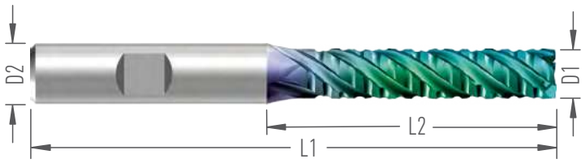
Cutting Conditions F8664

UMC		A_p	A_e	V_c	f_z according to the cutter diameter								
					4	5	6	8	10	12	14	16	20
P1-2	E	Dx4	Dx0,25	180	0,022	0,033	0,044	0,072	0,088	0,110	0,132	0,154	0,176
		Dx4	Dx0,75	110	0,009	0,011	0,017	0,028	0,033	0,039	0,044	0,050	0,055
		Dx4	Dx1	110	0,008	0,010	0,015	0,020	0,028	0,033	0,039	0,044	0,050
		∢α	15°	140	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P3-4	E	Dx4	Dx0,25	160	0,022	0,033	0,044	0,072	0,088	0,110	0,132	0,154	0,176
		Dx4	Dx0,75	100	0,009	0,011	0,017	0,028	0,033	0,039	0,044	0,050	0,055
		Dx4	Dx1	100	0,008	0,010	0,015	0,020	0,028	0,033	0,039	0,044	0,050
		∢α	15°	120	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P5	E	Dx4	Dx0,25	150	0,022	0,033	0,044	0,072	0,088	0,110	0,132	0,154	0,176
		Dx4	Dx0,75	90	0,009	0,011	0,017	0,028	0,033	0,039	0,044	0,050	0,055
		Dx4	Dx1	90	0,008	0,010	0,015	0,020	0,028	0,033	0,039	0,044	0,050
		∢α	15°	100	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P6	E	Dx4	Dx0,25	130	0,022	0,033	0,044	0,072	0,088	0,110	0,132	0,154	0,176
		Dx4	Dx0,75	85	0,009	0,011	0,017	0,028	0,033	0,039	0,044	0,050	0,055
		Dx4	Dx1	85	0,008	0,010	0,015	0,020	0,028	0,033	0,039	0,044	0,050
		∢α	15°	90	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065

RECOMMENDED VALUES FOR HELICAL IMMERSION

D1	4	5	6	8	10	12	14	16	20
DH	6,4	8	9,6	12,8	16	19,2	22,4	25,6	32
P	2,1	2,6	3,1	4,1	5,1	6,1	7,1	8,1	10,1

4 Flute Square Alternate Edge Rougher



Name	Dimensions (mm)								Order number	Stock	
	D1	D2	D3	L1	L2	L3	R	Z		V	W
F8665.4.V(W)6.64.20.Z4	4	6		64	20			4	13553	□	■
F8665.5.V(W)6.68.25.Z4	5	6		68	25			4	13554	□	■
F8665.6.V(W)8.75.30.Z4	6	8		75	30			4	13546	□	■
F8665.8.V(W)10.80.40.Z4	8	10		80	40			4	13547	□	■
F8665.10.V(W)12.107.50.Z4	10	12		107	50			4	13548	□	■
F8665.12.V(W)14.110.60.Z4	12	14		110	60			4	13549	□	■
F8665.14.V(W)16.130.70.Z4	14	16		130	70			4	13550	□	■
F8665.16.V(W)16.142.80.Z4	16	16		142	80			4	13555	□	■
F8665.20.V(W)20.165.100.Z4	20	20		165	100			4	13556	□	■

FEATURES

- Helix Angle 38°
- Non Center Cutting
- Chamfer 45°
- Center coolant supply
- Chip dividers on outside diameter
- Aurora X Plus TiAlSiXN coating

APPLICATION

- Roughing and Semi-finishing
- Immersion on 15° angle into full Ap/Ae
- Milling at full Ap/Ae smooth and silent
- Small chips easily removable
- Leaves straight sufrace (not smooth)
- Extremely powerfull and safe roughing tool
- Dedicated for carving in steel plates

5 x D do plna
5 x D slotting ability

UMC		Ap	Ae	Vc	fz according to the cutter diameter								
					4	5	6	8	10	12	14	16	20
P1-2	E	D×5	Dx0,25	180	0,02	0,030	0,040	0,065	0,080	0,100	0,120	0,140	0,160
		D×5	Dx0,75	110	0,008	0,010	0,015	0,025	0,030	0,035	0,040	0,045	0,050
		D×5	Dx1	110	0,007	0,009	0,014	0,018	0,025	0,030	0,035	0,040	0,045
		∢α	15°	140	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P3-4	E	D×5	Dx0,25	160	0,02	0,030	0,040	0,065	0,080	0,100	0,120	0,140	0,160
		D×5	Dx0,75	100	0,008	0,010	0,015	0,025	0,030	0,035	0,040	0,045	0,050
		D×5	Dx1	100	0,007	0,009	0,014	0,018	0,025	0,030	0,035	0,040	0,045
		∢α	15°	120	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P5	E	D×5	Dx0,25	150	0,02	0,030	0,040	0,065	0,080	0,100	0,120	0,140	0,160
		D×5	Dx0,75	90	0,008	0,010	0,015	0,025	0,030	0,035	0,040	0,045	0,050
		D×5	Dx1	90	0,007	0,009	0,014	0,018	0,025	0,030	0,035	0,040	0,045
		∢α	15°	100	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065
P6	E	D×5	Dx0,25	130	0,02	0,030	0,040	0,065	0,080	0,100	0,120	0,140	0,160
		D×5	Dx0,75	85	0,008	0,010	0,015	0,025	0,030	0,035	0,040	0,045	0,050
		D×5	Dx1	85	0,007	0,009	0,014	0,018	0,025	0,030	0,035	0,040	0,045
		∢α	15°	90	0,02	0,025	0,030	0,040	0,045	0,050	0,055	0,060	0,065

video

RECOMMENDED VALUES FOR HELICAL IMMERSION

D1	4	5	6	8	10	12	14	16	20
DH	6,4	8	9,6	12,8	16	19,2	22,4	25,6	32
P	2,1	2,6	3,1	4,1	5,1	6,1	7,1	8,1	10,1

real look of Ionbond AuroraX Plus coating

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